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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Adrian P. Stephens

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KACVINSKY LLC
C/O INTELLEVATE
P.O. BOX 52050
MINNEAPOLIS, MN 55402

EXAMINER

PARK, JUNG H

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/602,393	Applicant(s) STEPHENS, ADRIAN P.	
	Examiner JUNG PARK	Art Unit 2619	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 23 is/are allowed.
- 6) ☒ Claim(s) 1-22 and 24-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Remark

1. This communication is considered fully responsive to the Amendment filed on 12/10/2007.
 - a. An objection to the abstract is withdrawn since it has been amended.
 - b. The examiner acknowledges that RCE has been filed.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.
3. Claims 35 and 36 are rejected under 35 U.S.C. 102(e) as being anticipated by Fischer et al. (US 2002/0089927, "Fischer").

Regarding claim 35, Fischer discloses a method comprising:

- receiving permission to transmit information (TXAVAIL, see ¶.93) during a transmit opportunity (wireless medium, see ¶.93 and also fig.11);
- detecting one or more criteria (frame failure, see ¶.57); and
- selecting one of the following transmit modes based upon the detected criteria:
 - a) a transmit mode in which packets are transmitted so as to decrease latency for at least some of the packets (not delayed, see ¶.58); and
 - b) a transmit mode in which packets are transmitted so as to increase data throughput (improvement of throughput, see ¶.58);

wherein transmit mode a) comprises reserving a specific portion of a transmit opportunity for retries (specify a retry time duration, see ¶.57), and transmit mode b) comprises transmitting as many packets as possible during the transmit opportunity without specifically reserving a portion of the transmit opportunity for retries (using retry count ...up to the specified number of times, see ¶.57)".

Regarding claim 36, Fischer discloses, "wherein the criteria comprises a Quality of Service (QoS) field or QoS value or other value (QoS, see ¶.58)."

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-11, 13, 14, 28, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fischer in view of Ergen (IEEE 802.11 Tutorial, "Ergen").

Regarding claim 1, Fischer discloses a wireless system comprising:

- a memory (203 & 205 fig.2);
- a processor (CPU, see 201 fig.2) coupled to the memory (as shown in fig.2), the processor to allocate a first portion of a transmit opportunity for an initial data (transmission interval for frame F1, see 1101 fig.11 and ¶.77) and to allocate a second portion of the transmit opportunity for other operations including retries (intervals including retries, see fig.11 and ¶.77), the processor to transmit packets of the initial data during the first portion of the transmit opportunity (transmission interval for frame F1, see

1101 fig.11 and ¶.77), and perform other operations including retries of the initial data during the second portion of the transmit opportunity (F1 Retry, see 1105 fig.11), the initial data burst and the other operations including transmitting retries of the initial data burst being transmitted in the same transmit opportunity (F1 & F1 Retry, see 1101 & 1105 fig.11).

Fischer discloses the initial data, but silent on, “data burst”. However, Ergen discloses that medium is reserved for fragments transmitted in burst (see pg.30, ¶.1 in sec.2.2.13 and pg.23, ¶.2). Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to apply the reservation method for burst data taught by Ergen into the first frame F1 disclosed by Fischer in order to reduce transmission errors by avoiding competition for the medium (Ergen, see sec.2.2.13).

Regarding claim 2, Fischer discloses, “wherein the wireless system allocates the second portion of the transmit opportunity to retry any failed packets of the initial data burst, if necessary (No ACK & F1 retry, see fig.11).”

Regarding claim 3, Fischer discloses, “wherein the other operations are one or more selected from the group comprising: retry one or more packets in the initial data burst that failed, if any packets failed; transmit another initial data burst of packets if there is sufficient time in the transmit opportunity; release control of a channel back to a channel access controller; and reallocate a first sub-portion of the second portion for a second initial data burst and a remainder of the second portion for other operations (fig.11 and ¶.77).”

Regarding claim 4, Fischer discloses, “wherein the wireless system is adapted to allocate the first portion and the second portion based upon one or more detected criteria (unsuccessful, see ¶.57).”

Regarding claim 5, Fischer discloses, “wherein the wireless system is adapted to allocate the first portion and the second portion based upon a detected channel condition (¶.57).”

Regarding claim 6, Fischer discloses, “wherein the detected channel condition is selected from the group comprising: received signal strength; detected packet errors or failures; received bit error rate; measured packet failure; and other indicia of the probability of packet failure (¶.16; ¶.57).”

Regarding claim 7, Fischer discloses, “wherein the wireless system is adapted to further to calculate an upper bound for the initial data burst, and the wireless system to transmit packets of the initial data burst up to the upper bound (specified number of times, see ¶.18 and ¶.57).”

Regarding claim 8, Fischer discloses, “wherein the wireless system is further adapted to interrupt or stop the transmission of packets of the initial data burst when the upper bound is met, and then transmit any retries, if necessary, within the same transmit opportunity (fig.11 and ¶.77).”

Regarding claim 9, Fischer discloses, “wherein the wireless system further comprises an antenna, a transceiver coupled to the antenna and to the processor (fig.2)”.

Regarding claim 10, Fischer discloses a wireless system comprising:

- a memory (203 & 205 fig.2); and
- a processor (CPU, see 201 fig.2), the processor to estimate a number of packet retries for a data (retry strategy function and how many times, see ¶.58) based upon one or more detected criteria (if unsuccessful, see ¶.57), the wireless system to reserve a portion of a transmit opportunity for the estimated retries (how many times, see fig.11 and ¶.58) and then to transmit the data during a first portion of the transmit opportunity and any necessary retries during a second portion of the transmit opportunity (fig.11), the data and any necessary retries are transmitted within the same transmit opportunity (fig.11 and ¶.57-58).

Fischer discloses the data, but silent on, “data burst”. However, Ergen discloses that medium is reserved for fragments transmitted in burst (see pg.30, ¶.1 in sec.2.2.13 and pg.23, ¶.2). Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to apply the reservation method for burst data taught by Ergen into the frame disclosed by Fischer in order to reduce transmission errors by avoiding competition for the medium (Ergen, see sec.2.2.13).

Regarding claim 11, it is a claim corresponding to claim 9 and is therefore rejected for the similar reasons set forth in the rejection of claim 9.

Regarding claim 13, it is a claim corresponding to claims 1 & 9 and is therefore rejected for the similar reasons set forth in the rejection of claims 1 and 9.

Regarding claim 14, Fischer discloses, “wherein the wireless system allocates the second portion of the transmit opportunity to retry any failed packets of the initial data burst, if necessary, wherein the initial data burst and the retries are transmitted in the same transmit opportunity (fig.11 and ¶.77).”

Regarding claim 28, Fisher discloses a method of allocating time during a transmit opportunity comprising:

- detecting a channel quality or other criteria (if unsuccessful, i.e. frame failure, see ¶.57);
- reserving a portion of a transmit opportunity (specifying a retry time duration, see ¶.57) for expected retries (how many times to retry the frame, see ¶.57) based upon the detected channel quality or other criteria (if unsuccessful, how many times to retry the frame, see ¶.57);
- transmitting an initial data during a first portion of the transmit opportunity (transmission interval for frame F1, see 1101 fig.11 and ¶.77); and
- transmitting retries during the reserved portion of the transmit opportunity (intervals including retries, see fig.11 and ¶.77).

Fischer discloses the initial data, but silent on, “data burst”. However, Ergen discloses that medium is reserved for fragments transmitted in burst (see pg.30, ¶.1 in sec.2.2.13 and pg.23, ¶.2). Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to apply the reservation method for burst

data taught by Ergen into the first frame F1 disclosed by Fischer in order to reduce transmission errors by avoiding competition for the medium (Ergen, see sec.2.2.13).

Regarding claim 29, Fischer discloses, "wherein the detecting is selected from the group comprising: detecting a bit error rate; detecting packet failure or a packet failure rate; detecting packet retries; detecting a signal-to-noise ratio; detecting a received signal strength (¶.57)."

6. Claims 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Benveniste (US 2002/0154653, "Benveniste") in view of Ergen.

Regarding claim 15, Benveniste discloses a wireless system comprising: a processor (a processor, not shown in fig.2, is described in ¶.249), the processor adapted to calculate a probability of packet failure (congestion estimates ...failure, see ¶.41), to calculate an expected maximum number of retries based on the calculated probability of packet failure (number of re-transmission, see ¶.41 & 44) and a probability distribution (probability distribution, see ¶.44 and ¶.156-158); and to reserve a portion of a transmit opportunity for retries based upon the expected number of retries (reservation messages ...number of retransmission attempts, see fig.1D; ¶.41 and ¶.44), the processor to transmit a data (fig.1C) and any necessary retries within the same transmit opportunity (retry transmit opportunity, see fig.1D and ¶.44).

Benveniste discloses the data, but silent on, "data burst". However, Ergen discloses that medium is reserved for fragments transmitted in burst (see pg.30, ¶.1 in sec.2.2.13 and pg.23, ¶.2). Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to apply the reservation method for burst

data taught by Ergen into the first frame F1 disclosed by Fischer in order to reduce transmission errors by avoiding competition for the medium (Ergen, see sec.2.2.13).

Regarding claim 16, Benveniste discloses, "wherein the processor to calculate an upper bound for the initial data burst based upon the expected maximum number of retries (number of retransmission, see ¶.44) and the size of the transmit opportunity (window size, see ¶.41)."

Regarding claim 17, Benveniste does not explicitly disclose, "wherein the probability distribution comprises a Binomial distribution". The binomial distribution is used to characterize the number of successes over a series of observations (or trials), where each observation and plays an important role in statistics, as it is likely the most frequently used distribution to describe discrete data. Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to apply the Binomial distribution as the probability distribution function of Benveniste in order to have more accurate estimation values than other distribution functions.

7. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fischer in view of Ergen and further in view of Benveniste (US 2002/0154653, "Benveniste").

Regarding claim 12, Fischer and Ergen lack what Benveniste discloses, "wherein the processor to estimate the number of packet retries based upon one or more of a measured probability of packet error and a probability distribution (¶.156-158 and also see ¶.44)." Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to apply the method of estimating retransmission as taught

by Benveniste into the method of Fischer and Ergen in order to improve transmission channel allocation efficiently.

8. Claims 18-22, 24-27, and 30-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fischer in view of Benveniste.

Regarding claim 18, it is a claim corresponding to claim 1, except the limitation of “receiving permission to transmit information during a transmit opportunity”. Fischer further discloses, “receiving permission to transmit information during a transmit opportunity (Tx Available, see ¶.93) and is therefore rejected for the similar reasons set forth in the rejection of claim 1.

Regarding claims 19-22, they are claims corresponding to claims 4, 5, 6, & 3, respectively and are therefore rejected for the similar reasons set forth in the rejection of the claims.

Regarding claim 24, Fischer discloses, “wherein the receiving permission to transmit information during a transmit opportunity comprises at least one of: requesting permission to transmit data over a channel; and receiving permission to transmit data over the channel (Tx Available, see ¶.93).”

Regarding claim 25, Fischer discloses, “wherein the receiving permission to transmit information during a transmit opportunity comprises requesting (request, ¶.58) and receiving permission to transmit during a scheduled transmit opportunity (Tx Available, see ¶.93).”

Regarding claim 26, it is claim corresponding to claims 18, 20, & 21 and is therefore rejected for the similar reasons set forth in the rejection of claims 18, 20, & 21.

Regarding claim 27, it is claim corresponding to claim 3 and is therefore rejected for the similar reasons set forth in the rejection of claim 3.

Regarding claim 30, it is a claim corresponding to claim 26 and the limitation of "during the same transmit opportunity" is shown in fig.11 and is therefore rejected for the similar reasons set forth in the rejection of claim 26.

Regarding claim 31, Fischer discloses, "wherein the criteria comprises a Quality of Service (QoS) field or QoS value or other value (QoS, see ¶.57)."

Regarding claim 32, Fischer discloses, "wherein transmit mode a) relies upon one or more subsequent transmit opportunities or channel accesses to transmit one or more retries associated with the initial data burst (fig.11 and ¶.58)."

Regarding claim 33, it is a claim corresponding to claims 18 & 19, except the computer readable medium. However, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention was made to use software-based machines. The benefit using computer-readable medium is that program can be changed and upgraded for new features and is therefore rejected for the similar reasons set forth in the rejection of claims 18 and 19.

Regarding claim 34, it is a claim corresponding to claim 20 and is therefore rejected for the similar reasons set forth in the rejection of claim 20.

Allowable Subject Matter

9. Claim 23 is allowed.

Response to Arguments

10. Applicant's arguments with respect to claims 1, 15, 28, and 35 have been considered but are not persuasive.

At page 14, with respect to claim 28, applicant argues that Fischer fails to teach, "the reservation of a portion of a transmit opportunity prior to the transmit opportunity".

In reply, the limitations read on "specifies a retry time duration before transmitting as described in ¶.57 and fig.11". Therefore, the examiner respectfully disagrees.

At pages 14, with respect to claim 35, which recites features similar to those recited in claim 28, applicant argues that Fischer fails to teach all the elements of the claimed subject matter.

In reply, Fischer discloses all the elements as rejected in claim 35 and as described in the response of claim 28. Therefore, the examiner respectfully disagrees.

At page 15, with respect to claim 15, applicant argues that Benveniste fails to teach, "the processor adapted to calculate a probability of packet failure, to calculate an expected maximum number of retries based on the calculated probability of packet

failure and a probability distribution; and to reserve a portion of a transmit opportunity for retries based upon the expected number of retries.”

In reply, Benveniste discloses all the elements as rejected in claim 15. The examiner suggests pointing out which claim limitations are not disclosed by the reference.

The claimed “the processor adapted to calculate a probability of packet failure” read on “statistical distribution ...setting of mean and variance ...failure” as described in ¶.41.”

The claimed “calculate an expected maximum number of retries based on the calculated probability of packet failure” read on “probability distribution used to generate backoff retry adjustment functions” as described in ¶.44 and “the backoff procedure is repeated up to a maximum number of times” as described in ¶.120. That is, the maximum number of retry times is required to be calculated by retry adjustment functions using probability distribution.

The claimed “reserve a portion of a transmit opportunity for retries based upon the expected number of retries” read on “reservation messages ...number of retransmission attempts” as shown in Fig.1D and described in ¶.44. Therefore, the examiner respectively disagrees.

Further, applicant argues that Benveniste fails to disclose, “transmits the data burst and any necessary retries within the same transmit opportunity.”

In reply, the same transmit opportunity is defined in the specification as “during a second portion or remaining portion of the TXOP) and Benveniste discloses the transmit opportunity (TXOP) in fig.11D. Therefore, the examiner respectively disagrees.

At page 18, with respect to claim 1, applicant argues that the Fischer fails to disclose, "reserve a portion of a single transmit opportunity for retries".

In reply, the limitations reads on "specifies a retry time duration before transmitting as described in ¶.57 and fig.11". Therefore, the examiner respectfully disagrees.

Contact Information

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jung Park whose telephone number is 571-272-8565. The examiner can normally be reached on Mon-Fri during 6:15-3:45.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edan Orgad can be reached on 571-272-7884. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Edan Orgad/
Supervisory Patent Examiner, Art Unit 2619

Jung Park
Patent Examiner

